

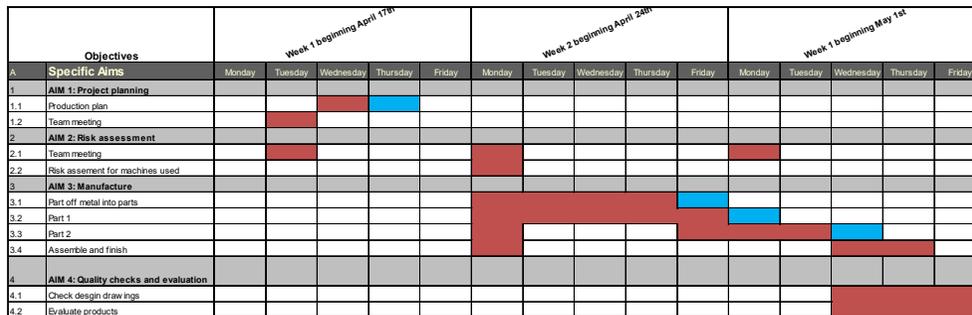
## Job Sheet

A **job sheet** is a document (usually just a page) containing instructions to help a worker do his **job**. It also contains details such as time it takes to perform a **job** and the materials needed or **used** for a **job**. Some **job sheets** have blank quantity for the worker to fill up during or after performing the **job**.

Item Number	Qty	Description	Material	Length	Width	Depth	Finish	Tolerance
1								
2								
3								

## Gantt Chart

A Gantt chart is a type of bar chart that illustrates a project schedule. This chart lists the tasks to be performed on the vertical axis, and time intervals on the horizontal axis. The width of the horizontal bars in the graph shows the duration of each activity.



Projected	
Actual	

## Vocabulary

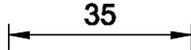
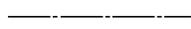
**Orthographic** - A formal engineering drawing that uses a 2D drawing of each side of an object and consists of a front view, a side view and a plan view.

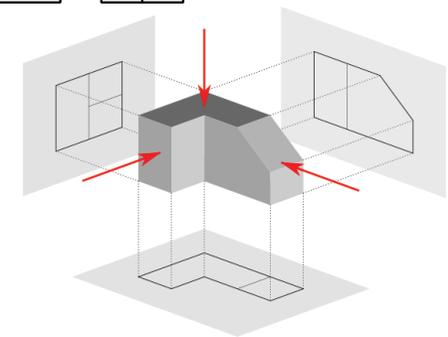
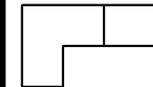
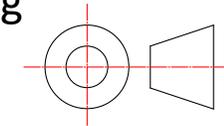
**Isometric** - Isometric projection is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings

**Cross section** - a section of something that has been cut down the middle to show what is inside.

**Hidden detail** - occurs when a feature of an object cannot be seen in one or more views.

## Engineering drawing

-  **Dimension**
-  **Construction line**
-  **Centre line**
-  **Drawing line**
-  **Diameter symbol**
-  **Radius**



An OP drawn in Third Angle will take an object, like the one shown below, and arrange the elevations in a specific orientation, shown left

## 1 SMART MATERIALS

Smart materials are materials that have properties which change reversibly, ie can change easily but can then easily change back, depending on changes in their surroundings.

### Photochromic pigments

Photochromic pigments change colour when exposed to light. Examples include glasses where lenses change to sunglasses outside.

### Microencapsulation

This involves encapsulating liquid or solid substances in tiny thin-walled bubbles. These microspheres gradually release active agents when rubbed, which rupture the thin-walled membrane. This can bring benefits such as smelling good to cover body odours in sports clothing.

## 4 THERMOCHROMIC

Thermochromic pigments change colour at specific temperatures.

Examples include colour-changing novelty mugs, colour-changing spoons, battery power indicators and forehead thermometers.



## 2 COMPUTER AIDED DESIGN [CAD]

### Advantages

+ Ideas can be drawn and developed quickly

+ Designs can be viewed from all angles and with a range of materials

+ Some testing and consumer feedback can be done before costly production takes place.

### Disadvantages

- Expensive to set up

- Needs a skilled workforce

- Difficult to keep up with constantly changing and improving technology.

## 5 TECHNICAL TEXTILES

**Fire-resistant Fabrics:** Fire-resistant fabrics have multiple uses. Not only are they used for items that are often exposed to flames, such as fire fighters suits, but also for items such as children's nightwear and cotton/viscose furnishings. Such items must be given a flame resistant finish by law.

**Gore-Tex:** This material has been designed to be waterproof yet breathable. It is used in clothing to provide a waterproof product that also releases perspiration vapour, and is therefore more comfortable to wear than traditional waterproof materials.

**Microfibres:** A very thin synthetic fibre which is often used for outdoor clothing and sportswear because they are breathable, durable, crease resistant and easy to care for. Some microfibers incorporate microencapsulation, this means the very thin fibres hold chemicals in tiny capsules. These capsules gradually break releasing chemicals, like perfumes, insecticides and antiseptics.

## 3 DYEING METHODS

**Resist Dyeing** allows patterns to be made with dyes using a coating, such as wax, or a barrier such as string to prevent the dye from reaching certain parts of the fabric.

**Batik** uses wax or a flour paste resist to draw a pattern on the fabric, which is stretched over a frame.

When the resist has dried, the fabric is dyed.

Small cracks that appear in the resist as it dries allow some of the dye through to the fabric.

**Tie Dye** involves folding, twisting, pleating or crumpling fabric then dyeing it with string or rubber bands before dyeing it.

The folding and tying of the fabric prevents the dye from reaching certain parts.

Multi-coloured designs can also be made.

## 6 SEAMS

**plain seam** - two pieces of fabric are joined together with a running stitch allowing for a seam allowance, which must be measured correctly to the desired width otherwise the garment being sewn will be the wrong size or shape, and needs neatening to prevent fraying (achieved by overlocking)

**flat fell seam** - very strong and required for textile products that are to be used, worn and/or washed a lot, seen on the right side of the fabric as two rows of stitching, eg on the inside leg seam of jeans

**French seam** - sewn twice starting with the wrong sides of the fabric together, the first at a depth of 1.0 cm, trimmed and re sewn at 0.5cm encasing the previous seam, self-neatening and used with fine fabrics to avoid becoming bulky

# Design Technology – Food: Preparation and Nutrition

<b>Secondary Processing</b>	<b>Changing primary food products into other types of products</b>
<b>Starter culture</b>	Harmless bacteria used to thicken cheese and yoghurt
<b>Lactose</b>	The name of the sugar in milk
<b>Lactic acid</b>	Lactose in milk is converted into this by bacteria in the starter culture
<b>Rennet</b>	This contains an enzyme that breaks down the milk into curds and whey
<b>Coagulate</b>	When protein sets
<b>Curds and whey</b>	The solid and liquid produced from milk during cheese-making
<b>Homogenisation</b>	Breaks up the fat globules so that they are evenly distributed through the milk, creating an emulsion.

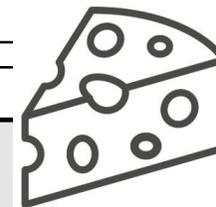


**Evaporated Milk** – 50% of the water is removed from the milk, which is then canned and heat-treated. The texture and flavor change. Uses – pour over desserts, tarte au chocolat filling.

**Condensed Milk** – Sugar is added to the milk, evaporated, canned and heat-treated to produce a sweet syrupy milk product. Uses – Fudge, caramel, millionaire shortbread.

**Dried Milk** – Pasturised milk is sprayed into large, heated chambers where water in the milk evaporated leaving a fine milk powder. Add water to dried milk and use as fresh.

**Cheese** is made from milk. Bacteria called ‘the starter’ is added to warm milk. This causes the sugar in the milk called lactose to turn into lactic acid. This acid gives more flavour to the cheese. Rennet is added which coagulates the milk into curds and whey. After heating the curd is cut and the whey is drained off. The curd is salted and then pressed into blocks to form the cheese. Some cheese is stored for a long time to mature it and develop the flavour.



## Cream – Types and Uses

Types of cream	Fat % / 100g	Uses
<b>Single</b>	18%	Pouring over desserts or in coffee. Cannot be whisked.
<b>Whipping</b>	35%	Pouring or whisked for piping onto cakes and desserts
<b>Double</b>	48%	Whisked into and piped onto desserts. Can be used for pouring.
<b>Clotted</b>	55-64%	Formed into quenelles on scones and desserts. It must not be stirred or beaten.

**Milk – Sources:** Cows, goats and sheep. Also available from plant sources for example almond milk, soya milk and coconut milk. **Nutritional value:** Milk is a good source of high biological value protein and calcium.

Type of milk	Temperature, time and processing method	Storage
<b>Pasteurised Milk</b>	Milk is heated to 72C for 15 seconds. Most bacteria are destroyed	In the fridge Use within 5 days
<b>Sterilised Milk</b>	Milk is heated to 110-130C for 10 -30 seconds. All bacteria are destroyed.	At room temperature for about 6 months. Once opened, refrigerate and use within 5 days.
<b>Ultra-heat treatment (UHT)</b>	Milk is heated to 135C for 1 second. All bacteria are destroyed.	At room temperature for about 6 months. Once opened, refrigerate and use within 5 days.
<b>Micro-filtered milk</b>	Milk is filtered and then heated to 72C for 15 seconds. (Pasteurisation) Most bacteria are destroyed.	In the fridge for up to 45 days. Once opened, use within 7 days

Shortcrust Pastry	Choux Pastry	Flaky Pastry
Does not rise, so it is used as a case to hold other ingredients. For example apple pie and quiche.	A light, crisp and hollow pastry. It puffs up, making it suitable for a variety of sweet and savoury fillings. Used for making profiteroles and eclairs.	A light, crisp pastry made up of lots of layers. Air is trapped between the layers of dough. When the dough is cooked, the air and steam created by the hot oven cause the pastry to rise up in layers. Used for pies, and sausage rolls.

# Design Technology - Workshop: Mortise and Tenoned Stool

## Key Vocabulary

<b>Mortise</b>	Square or rectangular hole made to accept tenon
<b>Tenon</b>	Cut into the end of a rail to fit into a mortise
<b>Mortiser</b>	Machine used to make square holes or mortises in wood
<b>Mortise gauge</b>	Tool that scratches 2 parallel lines to mark out a mortise
<b>Marking Knife</b>	Tool used to mark across the grain, usually with a try square
<b>Sash Cramp</b>	Long cramp with adjustable ends
<b>Managed forest</b>	Forest where trees are grown as a crop and replanted
<b>Conversion</b>	The process of turning trees into useable wood
<b>Plywood</b>	Manmade board made from layers or laminates of wood
<b>MDF</b>	Board made from fine particles of dust stuck together
<b>Laminate</b>	A layer. This could be a veneer of plywood or plastic layer
<b>Chipboard</b>	Particle board often made from recycled wood
<b>Sustainable</b>	Will not cause environmental harm in it's use / manufacture
<b>Finite</b>	Limited. Eg oil is a finite resource, it will eventually run out
<b>Infinite</b>	Unlimited, will replenish. Eg bamboo

## Manufactured Boards

Manufactured boards have become widely used in place of solid wood. These boards are available in large sheets of various thicknesses. An available range of manufactured boards includes plywood, chipboard and MDF

### Plywood

Plywood is made by gluing several thin layers of wood together. Each layer is called a ply. The plies are arranged so that the grain of each layer is perpendicular to the layer above or below it.



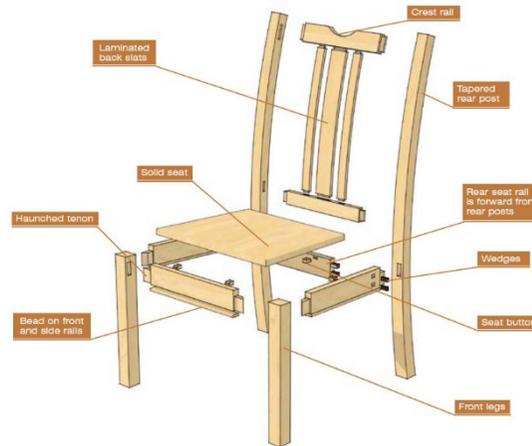
### Chipboard

Chipboard is made by gluing tiny wooden chips together. Heat and pressure are used during the gluing process. Chipboard is a cheap material and is best used in dry condition. It is often made from recycled material



**MEDIUM DENSITY FIBRE BOARD (MDF)** - A quality board, relatively cheap. This board is composed of fine wood dust and resin pressed into a board. This material can be worked, shaped and machined easily.

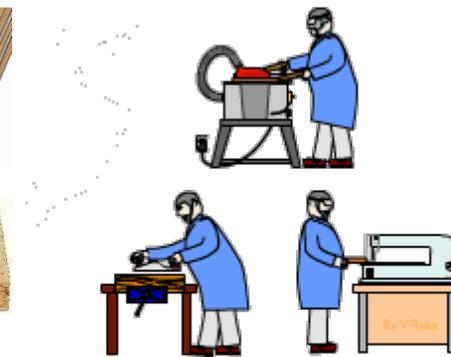
## Tools, Equipment and Processes



Most softwood comes from a managed forest and will be identified by logos such as the **FSC** Forest Stewardship Council stamp to certify that when trees are harvested new plans are grown in their place

Once harvested, the trees are stripped of their bark and cut into planks. These planks are dried. This can be carried out naturally but takes months or years to complete effectively. Usually they are put into a kiln where the moisture is removed in a controlled environment over a few weeks.

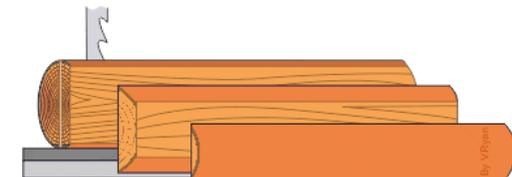
Rough sawn planks of timber can finally be cut and machined into their required dimensions



WHEN SEASONED, THE WOOD BOARDS ARE CUT TO SIZE AND SHAPE

**Mortise and tenon** joints are used on many wood based frame products. The joint involves cutting one part to fit inside another. This helps locate parts in the correct place, provides mechanical strength and a large surface area for the glue

**Sourcing, Harvesting and Converting Timber**  
Much of the timber we buy from a DIY shop is either **softwood** or **manufactured board**.



TREES ROUGH SAWN TO BOARDS